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This summary of a research project supported by the Fund for the Advancement of Education provides an overview of cooperative education programs. It discusses the historical background of such programs, educational advantages, assistance to students in helping to meet costs of college, administration of the programs, types of employers of students in the programs, and implications for the future. It also lists, by States, colleges and universities offering cooperative programs.

The report points out that although cooperative education programs are usually found in the fields of engineering and business education, they could be applied advantageously in other occupational fields. It recommends exploration and experimentation with a much wider range of occupational fields.

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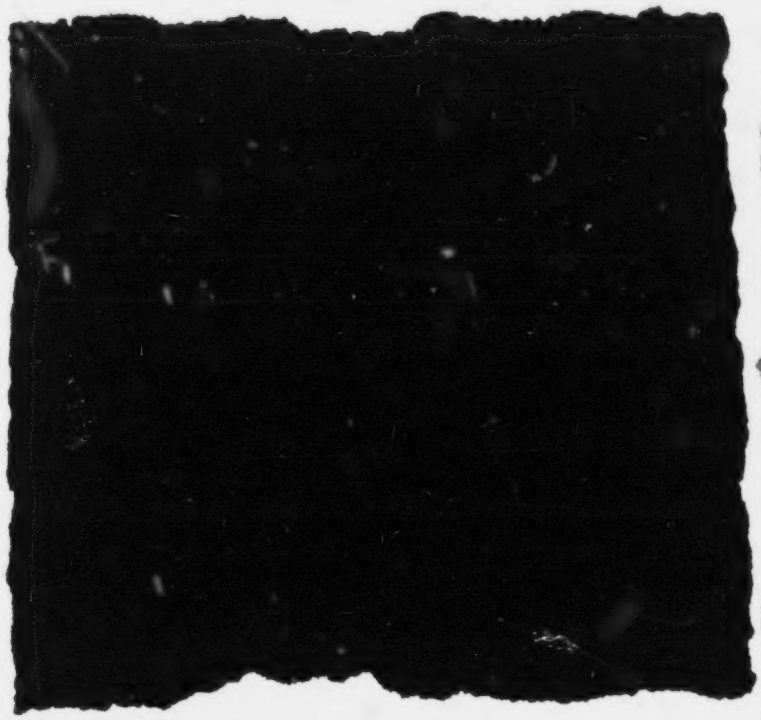
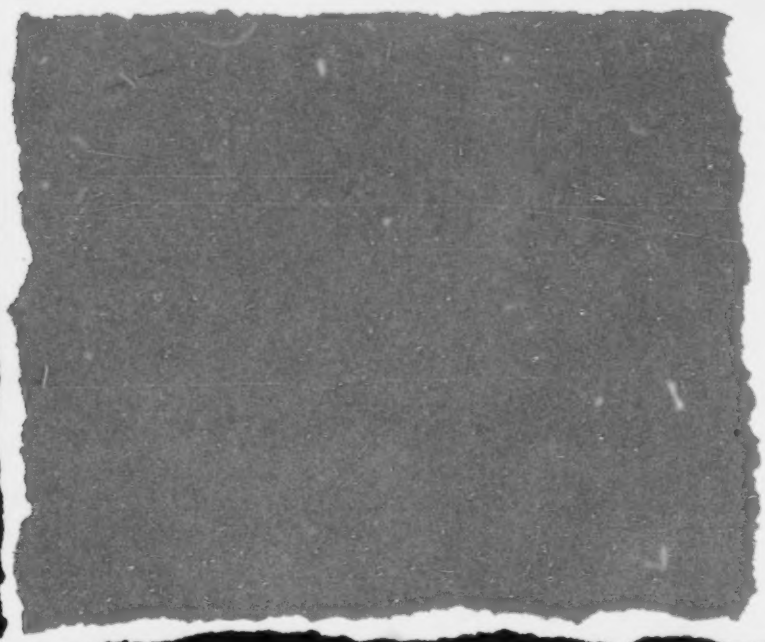
Report on Cooperative Education

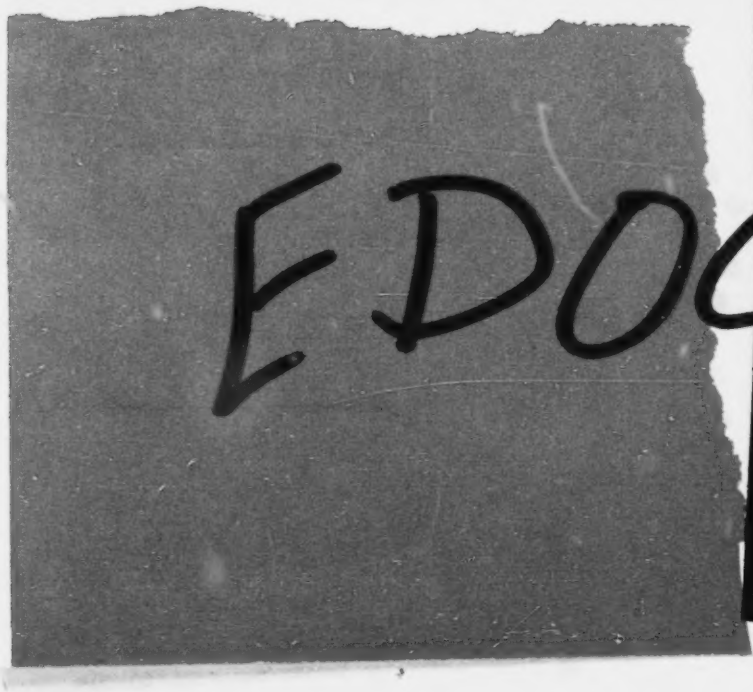
Summary of the National Study

8220

by Ralph W. Tyler
and Annice L. Mills







Report on Cooperative Education

Summary of the two-year national
Study of Cooperative Education
made possible by a grant from
The Fund for the Advancement of Education

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l mechanical engineering student
f Rochester Institute of
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lectric Co.

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The Study of Cooperative Education was supported by a grant of $95,250 from the Fund for the Advancement of Education.

The research project is reported in WORK-STUDY COLLEGE PROGRAMS: APPRAISAL AND REPORT OF THE STUDY OF COOPERATIVE EDUCATION (Harper & Brothers, 1961), which presents the data and the findings on which the conclusions reported in this pamphlet are based.

The Study was a direct out-growth of the Thomas Alva Edison Foundation's first national conference in May, 1957, on "Cooperative Education and the Impending Educational Crisis," in Dayton, Ohio, which was supported by Mr. Charles F. Kettering.

First announcement of the results of the Study was given, and the findings and recommendations discussed at the Edison Foundation conference on May 24-25, 1960, in Dayton, supported by a grant from the Charles F. Kettering Trust.

"The Princeton Conference on Work-Study in Higher Education" discussed the implementation of the Study. Mr. Eugene W. Kettering was chairman of this meeting, supported by the Kettering Foundation and held on June 28-29, 1961, in Princeton, New Jersey.

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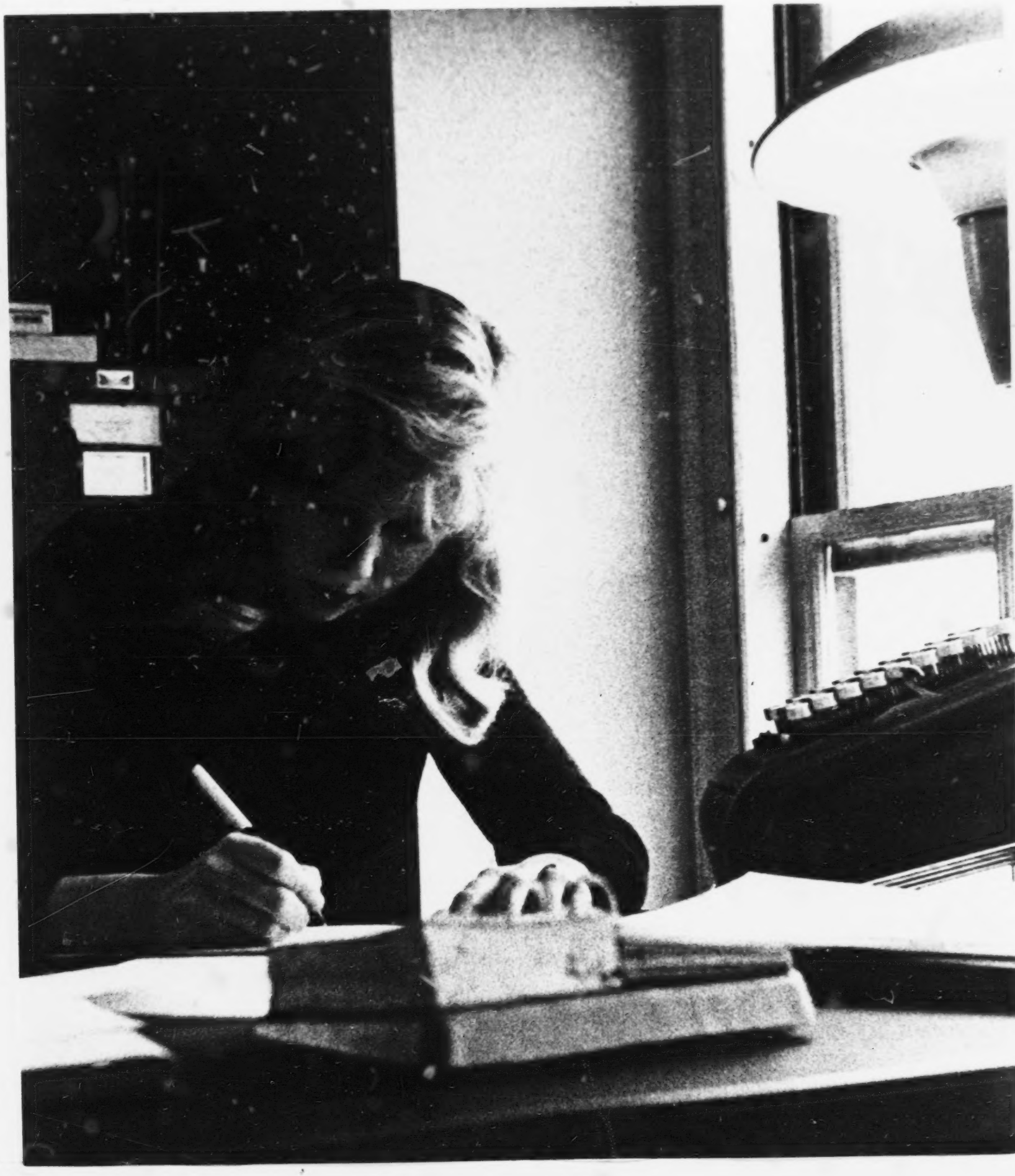


I. What Is Cooperative Education?

Last November, if you had travelled around the country, you could have met college students such as these:

A young man at work at the Republic Aviation Company, who is a student of engineering at the University of Detroit. An editorial assistant at South-Western Publishing Company who is working for her business administration degree at the University of Cincinnati. A student of General Motors Institute experimenting in a sound laboratory at the Frigidaire Division of General Motors. A history major at Antioch College taking down news stories in the Associated Press office in Washington.

All these young people reported for work just like any other employee, earning full wages for their positions. Although they were not then attending any classes, they were all enrolled college students working for degrees. All are on a program called "cooperative education," and the work they do is a degree requirement: they must build up a satisfactory work record, as well as pass their courses, in order to be graduated.

Cooperative education was originated in 1906 by Dean Herman Schneider of the College of Engineering at the University of Cincinnati. His plan was a simple one. He believed that if college students could spend a portion of time working in industry, promptly applying the knowledge and theory gained in school to practical work situations, their education would be richer and more meaningful. "It is a good thing," he said, "for a man to sweat his way toward the truth." Dean Schneider called his plan "cooperative education" because it depends essentially on the cooperation of industry.

Charles F. Kettering, the inventor of the self-starter and for many years the director of research for General Motors, was a close friend of Dean Schneider. Mr. Kettering employed cooperative students at General Motors, helped establish the General Motors Institute as a cooperative school, and also hired cooperative students in his own research laboratories. In 1957, he wrote of the cooperative plan: "What gives cooperative education its strength is that it lap-welds theory from the classroom with practice on the job. It creates a weld that is much stronger than the butt-welding of a college degree followed by employment, the two touching at only one line of contact."

Dean Schneider started with a group of 27 engineering students, who spent two weeks in class and then two weeks at work. Other institutions of higher education saw the potential of the program, and it was introduced at Northeastern University in 1909, at the University of Detroit in 1911, at Drexel Institute of Technology in 1920, and for the first time in a liberal arts college at Antioch in 1921. Today, some or all students in 66 colleges and universities are on the

A Bennington student tabulates statistics for a Harvard Business School professor during her winter non-resident term.

cooperative plan, majoring in engineering, business administration, the liberal arts and other fields.

FLEXIBILITY OF THE COOPERATIVE EDUCATION IDEA

One of the strengths of cooperative education is the flexibility of the principle of integrating theoretical study and practical employment. It has proved adaptable for men and women students. Among the cooperative colleges and universities are almost every type of institution of higher education in this country. There are co-educational institutions, men's colleges and women's colleges. Some of the cooperative colleges are public municipal colleges in large cities, most of whose students live at home and commute to classes. (Some of the cooperative colleges also have many evening students.) Others are residential colleges located in small towns. Thus, the cooperative students sometimes live at home both when they are in classes and on cooperative jobs. Others may go away to college, but live at home during work periods. Or they may live at home when they are in classes, but travel to another city for their jobs. Or they may live away from home both at college and on the job.

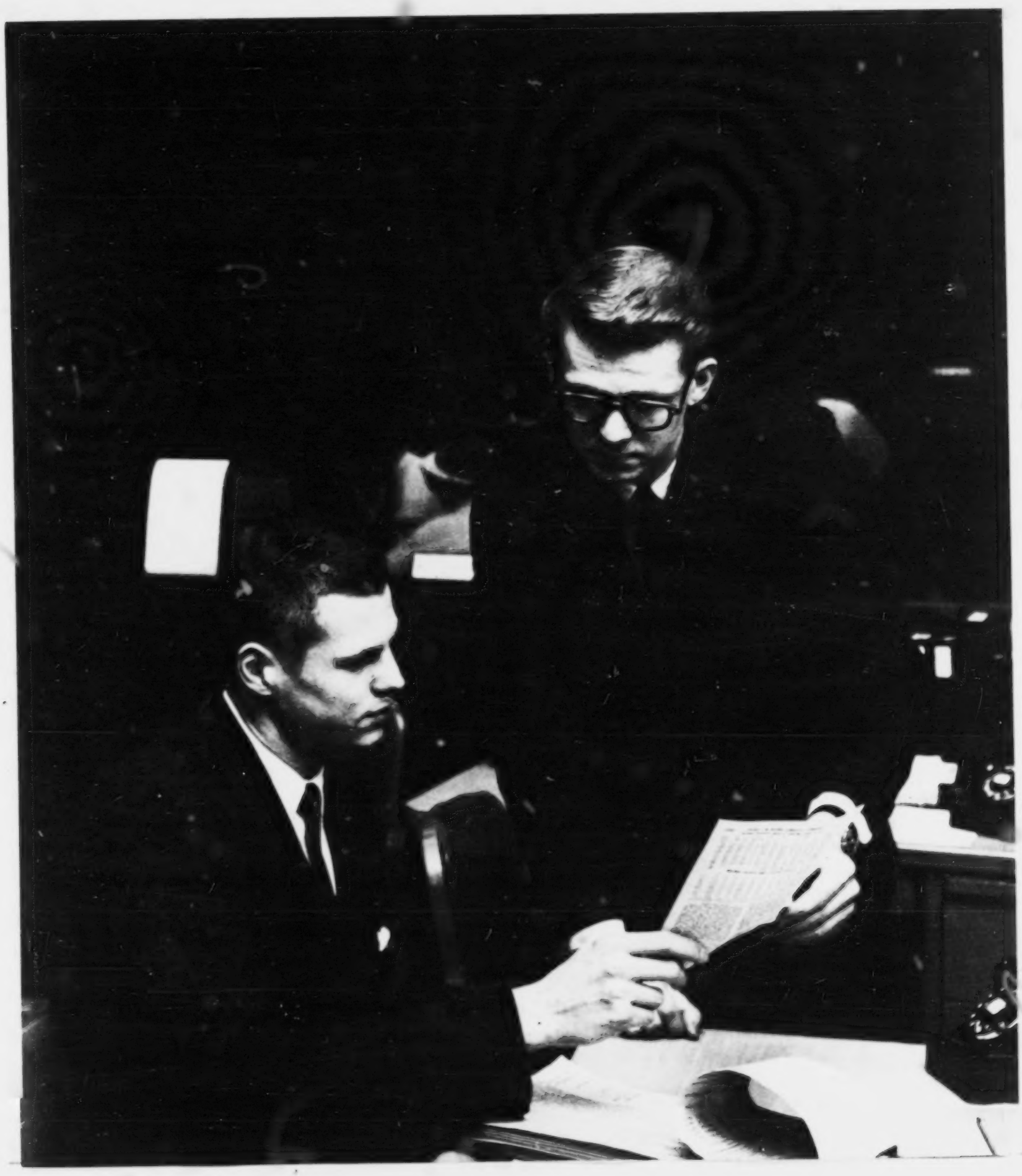
Cooperative education programs can include all or only some of the students. At some institutions, every enrolled student must participate in the work periods. Very commonly, cooperative education is offered in some, but not all, departments or schools of the college or university. At others, it is an optional alternative that only some of the students choose. At still others, it is an honors program for which a student must be specially selected. At a few schools even first-year students start the alternation of work and study, but in most cases the students spend one or two full years in course work before they start their cooperative jobs.

In some programs, the student will return to the same company for each of his work periods, and in other programs, he will hold jobs with a variety of employers. Especially in engineering, the cooperative program is organized so that the student returns to the same company and completes a "job circuit" of progressively more responsible positions. Other programs, especially in the liberal arts, intentionally place the student with a number of employers so that the student has the opportunity to learn the functions of a variety of organizations in the American economy and government.

A YEAR-ROUND PROGRAM

The cooperative student is usually in classes or on his cooperative job throughout the year, except for one summer month of vacation and the traditional academic recesses at Christmas and Easter. If the college is on the semester basis, the student will alternate semesters in classes with semesters at work; if the college is on the quarter system, classes and work are alternated by quarters. In either

The Ford Motor Co. employs cooperative students from many schools; a Northeastern engineering student works in the Transmission and Chassis Division.



case, both the study and the work periods are long enough to allow for real accomplishment and progress.

The question is often asked whether the student finds it hard to shift his attention from classwork to his job, and back again; the Study of Cooperative Education found that neither the faculty nor the students think this presents a special problem. Nor do cooperative students lose out on extra-curricular activities: at the University of Detroit, three of the eleven on the 1959 first team in varsity football were cooperative engineering students, and in 1958 the honor man in the mechanical cooperative engineering class was All-American in basketball.

Many, but by no means all, of the cooperative programs involve five years to complete the work for a Bachelor's degree, which may appear to be a disadvantage. Cooperative students and graduates, however, believe that on balance they were not handicapped in the start of their careers or their graduate work. On graduation, they have already had work experience and often go to work for an employer for whom they had worked during one or more of their work periods. The jobs in which they start are at least as advanced as and often more advanced than those of other college graduates.

II. Educational Advantages

What is the aim of the students in spacing out their college studies with these jobs, and why do the colleges and universities offer this program? In the opinion of these students and their colleges, and now confirmed by the Study of Cooperative Education, this plan offers certain definite educational advantages:

1. By coordinating work experience with the campus education program, *theory and practice are more closely integrated* and students find greater meaning in their studies.

2. This coordinating of work and study *increases student motivation.* As students see connections between the jobs they hold and the things they are learning on the campus, greater interest in academic work develops.

3. For many students, work experience *contributes to a greater sense of responsibilty* for their own efforts, *greater dependence on their own judgments* and a corresponding *development of maturity.*

4. Because the work experiences involve the students in relations with co-workers who come from a variety of backgrounds, and because success in these jobs requires constructive relationships with colleagues, most students in cooperative education develop *greater understanding of other people and greater skills in human relations.*

The first students to receive Masters in Business Administration on the cooperative plan worked in 1960-61 for the brokerage firm Paine, Webber, Jackson & Curtis, and took their academic work at the University of Detroit.

It is particularly valuable for these students to work with adults as a bridge between their years of schooling—living almost entirely with their own contemporaries—and their own adult life among mixed age groups.

5. Cooperative education helps markedly to *orient college students to the world of work*. Most college students are greatly concerned about their future life work. They want to know more about the range of occupations open to them and the potentials and limitations of these fields. They want to know about the qualifications demanded and their own fitness. In cooperative education programs, students have opportunities for exploring their own abilities in connection with real jobs and they find a direct means of gaining vocational information and guidance not only in the occupations in which they are employed but in a number of related fields as well. They have a chance to test their own aptitudes more fully than is normally possible on the campus. With this realistic try-out, a student may discover that he wants a different career than the one he thought he wanted on entering college; he can then change academic plans to prepare for this more informed vocational choice. Furthermore, students are able to understand and appreciate more fully the meaning of work to the individual and the function of occupations in providing the wide range of goods and services characteristic of our economy.

We of the Study Committee agree with the cooperative colleges that these educational advantages of cooperative education are of great value.

A student of electrical engineering in the cooperative program of Massachusetts Institute of Technology summed up what the experience had meant to him by saying, "I have gained a perspective. First and foremost, I have been able to see and work with electrical engineering as it is practiced today. I now have a better idea of what an engineer actually does, rather than a preconceived idea gleaned from the Sunday *Times* want-ads. I have learned a few basic technical skills and laboratory techniques which can only be acquired by experience on a job. I have had an opportunity to work with people who know what they are doing technically speaking, and I have been almost an apprentice to the skilled craftsman. This has frequently enabled me to ask questions and to get sound answers. Moreover, I have been able to see many different aspects of engineering. For instance, I have seen what people in Research and in Development Engineering do, what Production Engineering involves, and how Manufacturing is accomplished. I have a better idea of what sales and management policies, labor

Antioch has an Education Abroad program. One student spent her work period in a children's home in Stuttgart, Germany.

relations and personnel procurement in a large company entail. The other side of the coin is concerned with day-to-day, practical earnest living with people and oneself. I have worked for and with people, and have learned from them, and, if I am not being too presumptuous, I have taught them as well. I have widened my horizons of human experience and, I hope, my understanding and appreciation of people."

ARE COOPERATIVE STUDENTS DIFFERENT FROM OTHER STUDENTS?

The Study of Cooperative Education was concerned to find out whether there were particular ways in which cooperative students were distinguished from those of the traditional program. It was found that cooperative students show the same range of abilities on standard tests (for example, those of the College Entrance Examination Board) and achievements in high school in terms of grades, honors and activities. During their college years, their achievements are as good as those of the conventional students, and they earn as high scores on the Graduate Record Examinations in their major fields of study. The same proportion (about 35 per cent) continue their education in graduate school as do other students.

In the comparative Study, college goals for the individual students were examined. Differences were indeed found, but they are differences among the engineering, business administration and liberal arts students, rather than differences between cooperative and conventional college students. It was found that all college students agree that the primary goal of higher education is a basic general education and appreciation of ideas. The engineering and business administration students in both types of programs, however, paired this goal as equal in importance with vocational training which develops skills and techniques directly applicable to one's career. The liberal arts students, as might be anticipated, ranked this goal as definitely second to general education in their own college goals. Thus it is clear that cooperative education—even though it integrates jobs into the college program—does not vocationalize education; it does not appeal to students who are "ultra-practical," nor does it make them ultra-practical. Like other college students, cooperative students value general education.

The Study devoted much research to possible personal or social differences that might set cooperative students off from the mainstream of college students. It was found that cooperative students come from all levels of society—professional, middle class and working class families—just as do other college students. The investigation of possible personality differences revealed that cooperative students are as varied as any other college group. It would be no more correct to draw up a composite portrait of "the typical cooperative student" than

A Michigan stream is the job locale for this second-year biology student from Antioch, who ployed during the work te y the U. S. Fish and Wildlife Service.

a portrait of "the average American college student." Both in the cooperative and the conventional student groups, the same broad range of character and interests was found. The value and appeal of cooperative education, then, is not limited to any special type of student.

One socio-economic group is more heavily represented among the cooperative students, however, than in the average college population. About one-third of the cooperative students and graduates come from the lowest socio-economic third of our population, contrasted with only about 20 per cent of the conventional students and graduates from this group. It is a significant contribution to society for a college to attract more of these able young people whose parents may not have attended college and who may therefore not encourage their children to go. The progress of American civilization is based on a general upgrading of educational achievement, and cooperative education is making a more than proportionate contribution to this social goal.

III. Helping to Meet the Costs of College

The college men and women employed on cooperative jobs earn the going wages for the positions they fill. Often their income rises as they accumulate experience and progress through college. The Study of Cooperative Education found that cooperative students earn from $1,500 to $7,300 during their college careers. Engineering students earn an average of $7,000, business administration students average $5,600, and liberal arts students $3,700. There are some cooperative students who take unsalaried volunteer jobs, but typically the cooperative students have an income from their work. The 2,300 cooperative students of Drexel Institute of Technology earn about $4 million annually. The 1,000 engineering co-op students of Georgia Institute of Technology earn about $3 million annually; it would take an endowment of $75 million to provide scholarship funds to replace the students' annual earnings. Almost all cooperative students apply their earnings to college costs and their living expenses at college and while in cooperative jobs.

A useful comparison can be made with findings of a report from the University of Michigan Research Center: the average cost of attending college full-time for one year is $1,550 (1959-60). In a state university or other publicly-controlled school, the average cost is $1,300, and in a privately-controlled university, the average is $2,200. Of all university and college students in the nation, over half make some contribution from their own earnings to the expense of their education. Twenty per cent of all college students earn less than $500 a year, and thirty per cent earn amounts between $500 and $1,500 a year. Earnings of more than $1,500 are rare.*

A Fenn College education major holds a cooperative job as a teacher's aide during her work periods.

**How People Pay for College.* John B. Lansing, Thomas Lorimer, Chikashi Moriguchi. University of Michigan Survey Research Center for the U.S. Office of Education, 1960.

Cooperative students, then, are able to earn a greater than average share of their college expenses. However, very few cooperative students can finance all their college education entirely through their cooperative earnings; the families of half the cooperative students contribute 40 per cent or more of their college costs (60 per cent of the traditional students receive 40 per cent or more from their families). Family support is important, but for about 50 per cent of the cooperative students and graduates, college would have been doubtful or impossible without their own cooperative earnings (for comparable traditional students, only 37 per cent reported that college would have been doubtful or impossible without working). In fact, one of the recurring problems for the cooperative colleges arises when a student attaches too much importance to the salary of a job that has fewer educational opportunities than a lower-paying job. Although sympathetic with a student's need to earn money, the colleges consider that the ultimate value of a cooperative program is the educational benefit, and 64 per cent of the cooperative students and graduates agree with this.

But if more than half of all college students are now working for some of their college expenses, one might ask why the college itself should undertake all the arrangements necessary in a cooperative program. The first reason is that the cooperative colleges and universities are enthusiastic about the educational results. Second, because the usual arrangement involves a pair of cooperative students who alternately keep a job filled, and because they work at other times of year in addition to summers, the cooperating companies can probably give better jobs to cooperative students than to the traditional students, who are available all at one time in the summer. And third, and importantly, the cooperative school makes a special effort to ensure that the job has an educational component so that the working itself—and not the salary alone—makes a contribution to the totality of the college education. In addition, the cooperative students are seldom allowed to work part-time while they are taking courses; therefore, when they are attending classes, no part-time job competes for their study time.

Important as the earnings may be to individual students and their families, the cooperative program ensures that the job itself is a learning situation.

IV. College Arrangements for Co-op Education

The Study of Cooperative Education found that the most effective programs of cooperative education appear to be those which have been carefully worked out by each college in terms of its purposes, resources and kinds of students served,

and in cooperation with employers. The types of work experience, the method of coordination, the time rotation involved and other features are planned so as to maximize the values that the program can provide in the local situation. When cooperative education is treated as a basic concept for relating theory and practice in education, and when flexible arrangements and varied procedures are evolved rather than a rigid set of operations, the resulting program is likely to become a very successful one. Hence, our Committee recommends the use of imagination in developing programs that are appropriate to the conditions and purposes of the individual college.

As work programs are planned and developed and as the students rotate from college to work and back to college again, the faculty is better able to keep in touch with business, industry, and some of the professions. In many of the colleges, information gained through these contacts is used in planning the curriculum and in teaching, thus contributing to greater educational vitality.

Some of the programs, however, suffer from lack of understanding on the part of some members of the faculty. Usually in these cases the plans were worked out some years ago and the current faculty has not been directly involved in the program development. Often new faculty members do not take advantage of the opportunities provided for tying together the student's work experiences with his studies. The Study Committee recommends that the faculty be intimately involved in the planning and initiating of any new cooperative education program. After the program is established, there should be continuous participation by the faculty in the review and coordination so that they will have a more adequate understanding of the potential and the problems to guide their own teaching.

V. The Coordinator

Cooperative schools employ one or more persons to coordinate relations between education and industry. Often called a "coordinator," this staff member is usually a full-time faculty member with academic rank. Doing a job that contains many elements above and beyond vocational guidance, he is the single individual most responsible for success of the unique feature of cooperative education: the employment of students in jobs that contribute to their education. The coordinator is also responsible for developing and maintaining good relations with the firms and organizations who employ students during their work terms.

The coordinator holds orientation sessions with groups of students before they leave campus for their first work assignments, interviews the students indi-

vidually before he places them, and usually sees each of them when they return from a job. He keeps a cumulative employment file on each student, and is informed of the students' academic progress. But his job is not only a campus job.

It is considered good practice for a coordinator to visit each employer at least once a year to talk with those who place and supervise his students. If the college has cooperative arrangements with firms over a wide geographic area, this may involve a very ambitious travel schedule during certain times of year. Here he can make sure that students are being employed in ways that best capitalize on their abilities; he can "trouble-shoot" in situations where a student is not doing well in a job; and he may be able to develop new opportunities for cooperation with the employers.

On campus, the coordinator is the person most responsible for assisting students in the integration of classroom and work experiences. Faculty members also have obligations for this integration. Some coordinators responding to our question about this responsibility felt that the integation took place automatically or that it was not necessary; the Study Committee believes that coordinators should take the initiative in this area if they are not already doing so.

The number of people needed to staff a coordination department varies with the number of students in the cooperative program. At Antioch, there are ten full-time professional people, plus a clerical staff, for a student body of 1,450. Some programs are so small that one faculty member handles the counselling and job placement for all students involved, and can also teach some courses. Costs also vary: for 1960-61, Antioch estimated that their personnel department had a $120,000 annual budget, of which 10 per cent is for extensive travel, as Antioch places students throughout the nation. A more localized set of cooperative arrangements would mean less travel and a smaller coordination budget. Coordination is more costly if students change employers several times in the course of their college careers, rather than returning to the same employer for successive work terms. In any case, coordination is an added cost to the college, but long experience has shown it to be a good investment to ensure that the students' employment actually contributes to their education.

The coordination office can often include the functions of vocational guidance and the placement of graduates in permanent positions, in addition to the term-by-term placement of students.

A Georgia Tech engineering student uses a mass spectrometer to analyze evolved gases during laboratory vacuum melting at the International Nickel Co. works in Huntington, W. Va.

VI. Increased Utilization of Educational Facilities

The added expense of maintaining a coordination staff, at a ratio of about one per 100 or 150 students, should be weighed against the possible economies of

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increased utilization of educational facilities with a cooperative plan. The first way in which cooperative education can be a saving is the operation of the college at full capacity throughout the summer. (This is, of course, possible without cooperative education.) The second and unique way in which cooperative education increases the use of facilities is through staggered student attendance. The cooperative students who are on the work block of the program are not in classrooms nor occupying dormitory rooms.

It is hard to generalize about the economies of cooperative programs because practices vary so widely on many arrangements. In some programs, all students of the institution, or all students of a school or department, participate in the cooperative program, but in others it is only selected students. Cooperative employment can be started in the first, second or even third year of college. Programs operate on the three-term schedule or on the quarter basis. Some programs include many work periods so that the student spends five, rather than the traditional four, years in a B.A. program; others include fewer work periods and the student is graduated in four years.

In the most extreme case of a five-year program with all students starting to co-op in their freshman year, the capacity for enrolled students is double that of the comparable traditional program. However, because the program requires five years instead of four, the number of graduates is not doubled, but is about one-and-a-half times as great. Few cooperative schools, however, send first-year students on work periods, so that in practice the increase in enrollment is usually less than double that of a comparable traditional college.

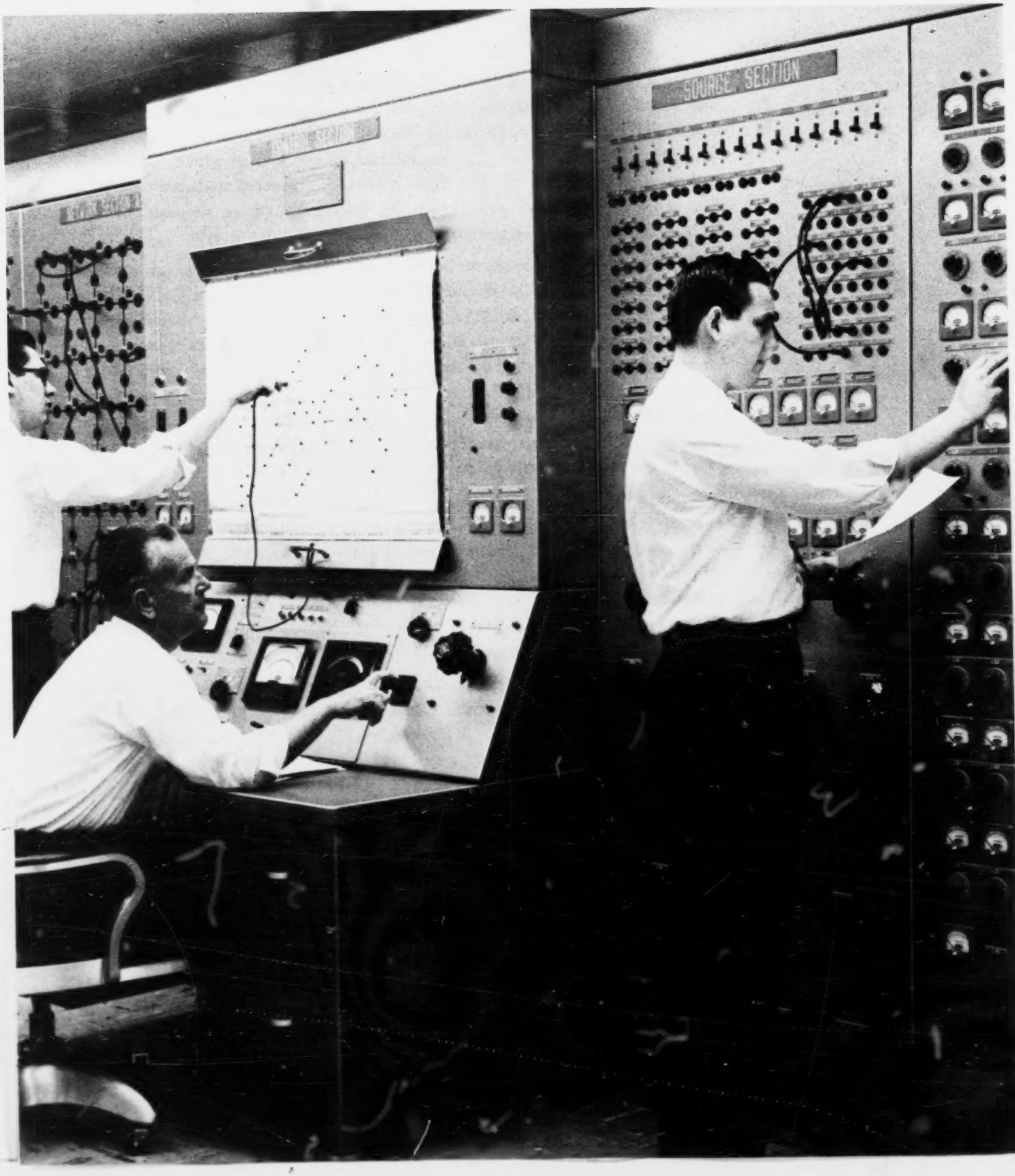
In addition, the college must make new arrangements with its faculty. The faculty may prefer to teach more weeks each year for a greater salary. Year-round full operation of the college may require a larger teaching staff. Especially in arrangements with its faculty, each college must make decisions in light of its goals.

It is clear that there are additional costs for faculty and for coordinators in a cooperative program; however, the economies of a cooperative program that involves all students can be sufficient to result in a net saving in costs-per-graduate.

VII. Employers of Cooperative Students

The employers of cooperative students include many of the country's major manufacturers, research laboratories, air lines, units of federal, state and local government, banks, professional groups, hospitals, newspapers and publishing houses, department stores, and school systems and child-care centers. The number of industrial and other employers of cooperative students runs into the thousands. No census has been done of employers cooperating in these pro-

An aeronautical engineering student from the University of Cincinnati is a test observer on a high-altitude experimental flight aboard a Boeing B-47 at Wichita, Kansas.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grams, but we know that the University of Cincinnati cooperates with 500 companies in thirty states, Drexel with 600 companies in sixteen states, and Northeastern places students with 900 companies. Usually a company employs cooperative students from several colleges and universities. General Motors, for example, employs 237 cooperative students from eighteen different colleges and universities, as well as all the 2,500 students of its own General Motors Institute.

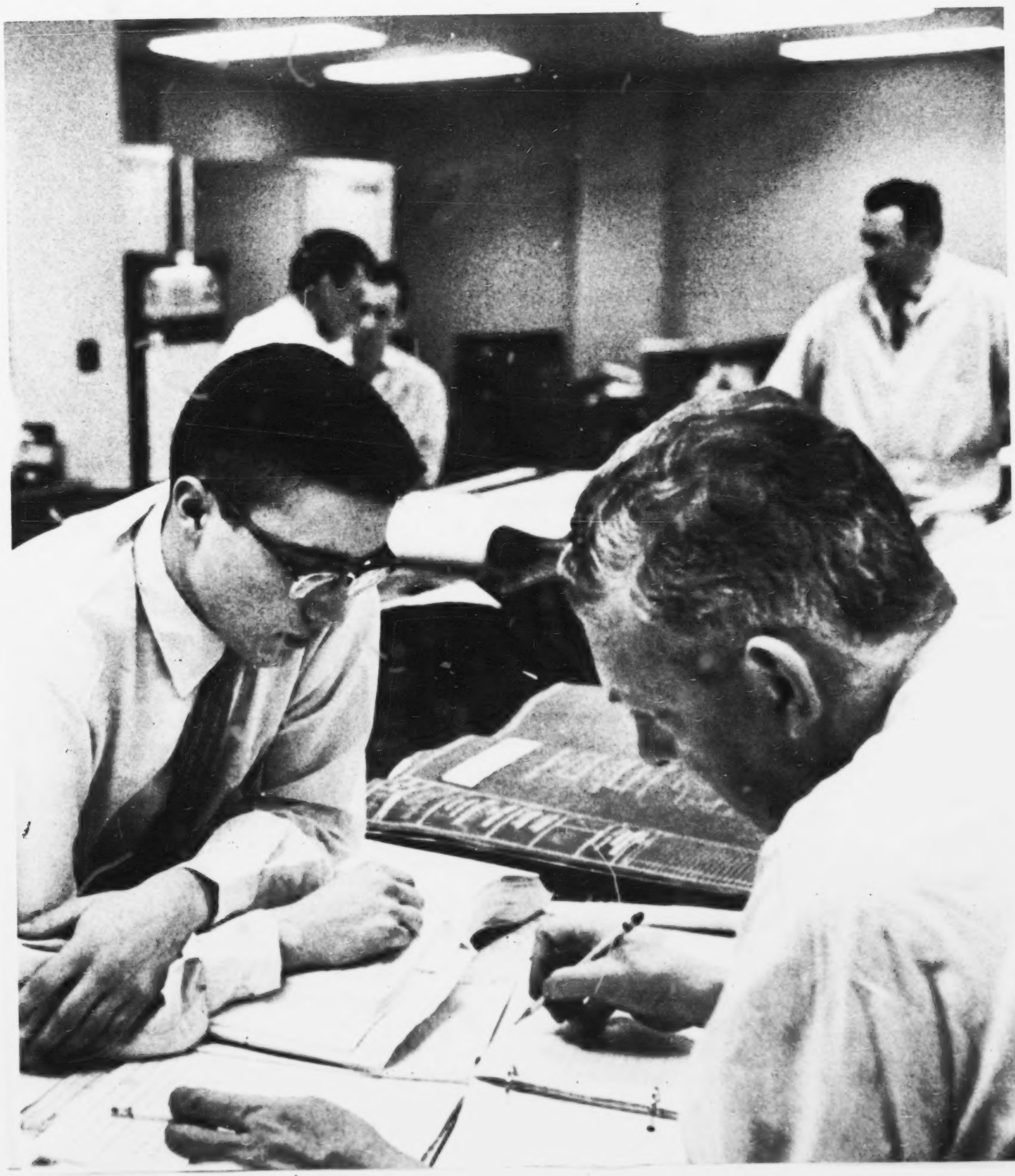
A number of graduates of the cooperative plan are now in positions of leadership in American life. To name only a few, Edward Cole, head of the largest division of General Motors, Chevrolet, and Cyrus Osborn, Executive Vice President of GM, are graduates. There is John L. Burns, President of RCA, and Kelly Y. Siddall, Administrative Vice President of Procter & Gamble. President Kennedy's assistant for Congressional relations, Lawrence O'Brien, is a cooperative graduate, as is Rod Serling, the television dramatist.

The more effective programs have gained the understanding and support of the employers involved, and are treated as an integral part of the company's personnel program. In a close and responsible relationship, the employer and the college have planned the work experience and the selection of students qualified to undertake the job assignments, and the employer maintains a relatively stable level of cooperative employment through the fluctuations of the business cycle. This responsible relationship also helps in dealing with individual problems as they arise, since the college coordinator and the employing organization are both familiar with the purpose and plan of the program.

One of the principal reasons cited by employers for participation in cooperative programs is that it provides them with a regular flow of qualified talent. The firm is able to observe a student through several months or even several years before having to decide whether to hire him permanently on graduation. In this respect, it is used as a recruiting and selection device to attract capable personnel with the best potential for specific areas of work in the company.

Executives of the Cincinnati Milling Machine Company, The Detroit Edison Company, Chrysler Corporation, the General Electric Company and General Motors Corporation—each of which has had extensive experience with cooperative students from several colleges over a number of years—were asked about the retention of graduates who have been employed as undergraduate cooperative students. The percentage of cooperative students retained by these organizations ranged from 40 to 89 per cent, with an average retention of 55 per cent. This compares favorably with the average retention of other college graduates recruited, which was somewhat less than 50 per cent. (In comparing these retention rates, it should be noted that the base group regarding coopera-

The Philadelphia Electric Co. assigned these Drexel students to do a load and stress analysis on an analog computer, located 20 miles from the suburban power system of which it is a model.



tive students is all cooperative students employed by the company at some time during their undergraduate career, some of whom will have changed employers even before graduation, while the base group for other college graduates were all recruited after college graduation.)

The retention rates of cooperative graduates vary in a wide range. A greater percentage was retained in the case of companies that employ students from the plant community who attend a local college or university. It is also high in the special case of General Motors Institute, all of whose students hold cooperative jobs only in General Motors Corporation, and who have been selected for permanent employment by a particular division before they are admitted to GMI. The retention rate of cooperative students was lower in programs where the company employs more undergraduate co-op students than they plan to hire on graduation and then selects a smaller number as permanent employees when they graduate.

COOPERATIVE GRADUATES AS PERMANENT EMPLOYEES

Cooperative graduates employed by the company in undergraduate years do not need as long to become oriented to their permanent jobs. They already know their way around the organization, they have developed an ability to get things done, and have learned how to get along with people with a diversity of skills and backgrounds. The conventional college graduates, in contrast, have associated during their college years mainly with students and academic people; while about half of them have worked either in the summers or during their school years, this work may have had no relation to their future employment goals. The Armco Steel Corporation college relations representative reports interviewing a young metallurgical engineer who had spent his four summer vacations working as an elevator operator; he had never been in a steel mill before visiting the company for his employment interview.

Employers believe that cooperative graduates have somewhat better judgment, are responsible, more mature, better oriented to industrial work and better acquainted with company policies and practices than traditional college graduates. These differences disappear in from two to five years, but during these early years of permanent full-time employment, the cooperative graduate is judged to be more useful to his employer than the traditional college graduate.

Cooperative education relations with colleges appear to be advantageous for companies in terms of retaining employees. Costs of recruiting professional employees, especially engineers, have been quite high in recent years. It must be remembered, however, that in order to use this recruitment device, the company must have this student and his partner as an employee through a period of a year or more. The student is paid prevailing wages for his work. He may

Eggers and Higgins, New York, architects employ an engineering co-op as a statistical clerk.

be entered in the retirement and other welfare benefits from the first day he works for the company. He may have to join a union in order to hold the job, or the company may have to negotiate special arrangements with the union in order to employ him.

Is it worthwhile to the company to have him as an employee during his college years in order to have a better chance of retaining him on graduation? Cooperating companies believe so. Nearly twice as many students could have been placed in recent years had they been available, according to estimates of college coordinators. Cooperative education might be regarded as a very costly recruitment and training device, and this would certainly be true if the students did not do productive work. In fact, however, employers believe the work the students do justifies the salaries they are paid, and, on the average, employers report the cooperative students are worth at least 80 per cent of what they are paid. In many companies, the salaries of cooperative students are not carried on training budgets, but on the regular departmental budgets.

Employing companies find cooperative students valuable as semi-professional technicians or aides working with members of the full-time professional staff. This allows the professional staff to concentrate their efforts and talents in creative work for which they are best qualified. It might be advantageous for a company which needs many aides or technicians to employ cooperative students even if its need for graduate engineers is much lower; no company is committed to offer post-graduate employment to all students it employs as undergraduates. As technicians, the cooperative students gain a breadth of knowledge of industrial operations, and practical experience in such important areas as costs, quality control and meeting schedule deadlines. It helps students learn to apply theoretical information to practical problems at a time when this knowledge is freshest in their minds, thus assisting in maturing them professionally.

An effective cooperative education program requires a high degree of cooperation between the company and the colleges and universities from which the students come. It is usually good practice to designate a specific personnel officer to keep in close contact with the coordinators in the cooperating colleges. The work program of the student should be carefully planned, with the employer and the educational institution working together to integrate the student's working and academic experiences. The daily supervision of the students is by the department heads of the departments to which they are assigned, of course; but the personnel officer responsible for the cooperative program will plan the rotation of students, see that department heads and others understand the aims of the cooperative program, and work with college coordinators if problems arise. Some companies hold employment orientation sessions when the students

first arrive from the various colleges; these sessions may be continued to allow students to share experiences while on the job.

Students must be carefully selected to fit into the organization and have the potential to make some contribution to it. Techniques of selection similar to those used in recruiting college graduates and high school graduates to be trained in apprenticeship and other special programs should be utilized. The employer must look beyond the academic background of the student to his aptitudes, interests and personal qualifications.

Students are often required by their college, the employer or both to write a report on their employment term. This report coordinates the practical work and academic learning, and helps develop skill in writing within his field. Students may have other writing opportunities. For example, at The Detroit Edison Company, the co-op student helps the engineers he works with to write reports, and news items or articles for Detroit Edison's newsletters.

The most serious problem in the maintenance of a successful cooperative relationship between a company and a college is the business cycle. In the 1958-59 recession, half of the thirty companies responding to the Study's questionnaire reported no cut-back in their cooperative programs; the others had to reduce the total number of students in the program or refrain from taking on new students. One company terminated the program. However, because of the backlog of requests for cooperative students, none of the colleges reported serious difficulties during the lag in business.

Only the clear recognition on the part of the employer that the work-study program is a long-range and essential part of the firm's operation, and not a luxury or gratuity given to the college or the student in affluent times, can maintain the necessary stability of cooperative education. It is not only the college and students who suffer when a firm cuts back on its employment of cooperative students; the firm itself may create future shortages of trained personnel in its own staff by temporary cut-backs in this training program as in any other. The number of students to be employed should be determined on the basis of a realistic forecast of personnel needs four or five years hence, and it should continue in spite of fluctuations in the national economy.

Finally, employers of cooperative students are making a contribution to higher education by employing students in jobs which contribute to their education and in which students can earn some of their college expenses.

VIII. Extending Cooperative Education

"There are tremendous needs in the decades ahead for a much larger number of well-educated people in science, technology, business and the professions. Our

MAIN BEARING
MAIN BEARING

first recommendation is to extend cooperative education much more widely. A program which increases student motivation, helps the student to find more meaning in his school studies, attracts more able young people into higher education and enables more of them to go to college should be extended far beyond the relatively small number of colleges now using cooperative education (about five per cent of U. S. colleges and universities). The primary recommendation of the Study Committee of the Study of Cooperative Education is that American education make wider use of the principle of cooperative education.

We want not only to make the general recommendation but to mention some areas in which cooperative education seems to offer promise of constructive contribution, although there are now few or no programs in these areas.

There are only a few liberal arts colleges making use of the cooperative education principle. The findings of this Study indicate both the values and the feasibility of cooperative education in colleges of liberal arts. We recommend that other liberal arts colleges consider the potentialities of a program of work-study for their student bodies.

In extending cooperative education, we recommend exploration and experimentation with it in post-graduate education. The cooperative plan is now being offered in graduate work at the University of Cincinnati in engineering and the physical sciences, at the University of Detroit in business administration, and at Northeastern in engineering. We urge other institutions to experiment with post-graduate cooperative programs. Most graduate students are now employed part-time as a means of financing their study, but the necessities of a job provide no guarantee of certain of the values of a work experience carefully planned to relate theory and practice. Here is a field of important pioneer work.

Cooperative programs for men are much more common than those for women and yet the findings of this Study indicate the values of such programs for women in career exploration, in developing self-confidence, in maturing judgment and in developing greater independence. We recommend a great increase in experimentation with cooperative programs in the education of women.

At present, cooperative education programs are most often found in engineering and business education. But it could be applied advantageously in other occupational fields. Teaching, social work and the civil service are three occupations in which there are serious shortages of trained personnel. It seems likely that cooperative programs designed in each case to meet the special needs of the profession would attract additional students and help to improve their educational experience. There should be exploration and experimentation with cooperative programs in a much wider range of occupational fields.

All students of General Motors Institute are first chosen for employment by a division of GM. At the Electro-Motive Division, a "co-op" records data in the experimental testing of an improved diesel engine design.

COOPERATIVE PROGRAMS

The following list, by states, of colleges and universities offering cooperative programs was compiled by the Study of Cooperative Education in the fall of 1958, with later additions that have come to the attention of the Committee. It is to be noted that at many of these institutions, only some of the students are on the cooperative plan: it may be an optional plan, it may be offered in only some academic majors, it may be an honors plan.

For example, at the University of Cincinnati, all engineering and architecture students and some business administration students are on the cooperative program; at Antioch, all students in all fields of study are on the cooperative plan; at Cornell, the cooperative program is an honors program in engineering.

The interested student should write to the admissions office of the college or colleges of his choice requesting further information about the cooperative program and the other features of the college's programs.

ALABAMA
Auburn University, Auburn
University of Alabama, University

ARIZONA
University of Arizona, Tucson

CALIFORNIA
Los Angeles State College
San Jose State College
University of California, Berkeley
University of California, Los Angeles

COLORADO
University of Denver

FLORIDA
Stetson University, De Land
University of Florida, Gainesville
University of Miami, Coral Gables
University of South Florida, Tampa

GEORGIA
Georgia Institute of Technology, Atlanta
University of Georgia, Athens

ILLINOIS
Bradley University, Peoria
Illinois Institute of Technology, Chicago
Northwestern University, Evanston

INDIANA
Evansville College, Evansville
Purdue University, Lafayette
Tri-State College, Angola

IOWA
Iowa State University, Ames

KENTUCKY
Berea College, Berea
University of Kentucky, Lexington
University of Louisville

LOUISIANA
Louisiana Polytechnic Institute, Ruston
Louisiana State University, Baton Rouge

MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
Northeastern University, Boston

MICHIGAN
General Motors Institute, Flint
Kalamazoo College, Kalamazoo
University of Detroit
University of Michigan, Dearborn
Western Michigan University, Kalamazoo

MINNESOTA
Concordia College, Moorhead
University of Minnesota, Minneapolis

MISSISSIPPI
Mississippi State University, State College

MISSOURI
University of Missouri School of Mines and Metallurgy, Rolla

NEBRASKA
Municipal University of Omaha

NEW MEXICO
New Mexico State University, University Park

NEW YORK
Bard College, Annandale-on-Hudson
City College of New York
Cornell University, Ithaca
Keuka College, Keuka Park
Rensselaer Polytechnic Institute, Troy
Rochester Institute of Technology

OHIO
Antioch College, Yellow Springs
Fenn College, Cleveland
Sinclair College, Dayton
University of Akron
University of Cincinnati
Wilmington College, Wilmington

PENNSYLVANIA
Drexel Institute of Technology, Philadelphia
Lehigh University, Bethlehem
St. Joseph's College, Philadelphia
University of Pittsburgh

SOUTH DAKOTA
Dakota Wesleyan University, Mitchell

TENNESSEE
Southwestern at Memphis
Tennessee Polytechnic Institute, Cookeville
University of Tennessee, Knoxville

TEXAS
Southern Methodist University, Dallas
University of Houston

VERMONT
Bennington College, Bennington
Goddard College, Plainfield

VIRGINIA
Virginia Polytechnic Institute, Blacksburg

WASHINGTON
Seattle University

WISCONSIN
Marquette University, Milwaukee

FACTS ABOUT THE STUDY OF COOPERATIVE EDUCATION

The information presented in this summary was gathered in the course of the Study of Cooperative Education. The full research report has been published by Harper and Brothers, under the title of WORK-STUDY COLLEGE PROGRAMS: APPRAISAL AND REPORT OF THE STUDY OF COOPERATIVE EDUCATION (Harper's, 1961, 246 pages, $4.00).

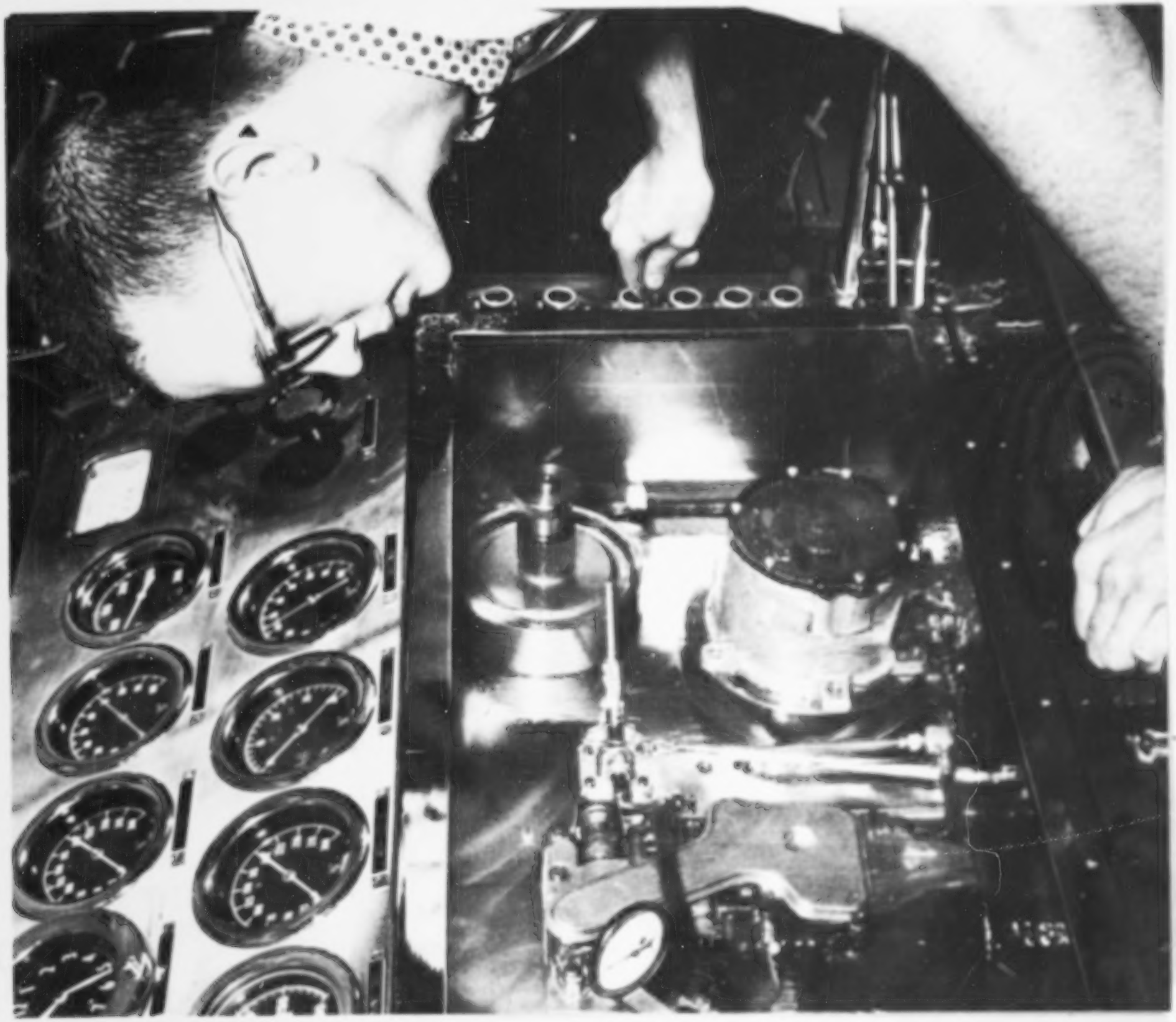
Liberal arts, engineering and business administration programs were studied in 22 cooperative programs, and compared with programs in the same fields at traditional four-year colleges as similar as possible in size and educational goals. A total of 5,300 students and graduates in the classes of 1939 to 1963 gave information through interviews or questionnaires.

The College Experiences Questionnaire and the College Graduate Experiences Questionnaire were constructed especially for this Study. The Activities Index and the College Characteristics Index were also used, as well as academic records from high school and college, and the College Entrance Examination and Graduate Record Examination results.

The National Opinion Research Center conducted interviews with 235 cooperative education graduates and 251 other college graduates for this Study; the average length of each interview was one hour and 15 minutes.

The Study of Cooperative Education was financed by a grant from the Fund for the Advancement of Education. Dr. Ralph W. Tyler served as chairman of the eleven-member Study Committee, and the staff was Dr. James W. Wilson, Executive Director, and Edward H. Lyons, Associate Director.

Information was also given by 163 members of the faculty and administration of 28 colleges and universities; 16 coordinators of cooperative programs; and 30 employers of cooperative students.



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